GS1 US

US

The Global Language of Business

Data Quality ROI Calculator for Brand Owners:

Warehouse Costs and Case Dimensions

GS1 US National Data Quality Program

The GS1 US National Data Quality Program addresses the need for complete and accurate product data by providing a common approach to data quality for organizations to adopt. This common approach will promote a level of trust about product information received or retrieved by trading partners and consumers alike.

The Program is based on a comprehensive approach to data quality that encompasses:

- *data governance within an organization to support the creation and maintenance of product data*
- *education and training within an organization with regard to creating and maintaining accurate product data*
- *comparing product attributes to data being shared with trading partners to have confidence that the data shared is accurate, complete and timely*

For additional information, visit:

http://www.gs1us.org/dataquality

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Introduction to the Series:

calculate ROI to justify your data quality program

Most companies understand the basic premise of data quality: *inaccurate data can be detrimental to business*. However, the challenge for many companies has been how to calculate a Return on Investment (ROI) to justify the resources needed to address data quality issues within their organization.

In other words, how do you quantify quality?

When it comes to tackling data quality issues, the GS1 US National Data Quality Program advises companies to start small – with only one or two pieces of data. This guidance also applies to ROI: develop an ROI for one or two key pieces of data that can quantifiably illustrate the cost of inaccuracies, and conversely the benefit to be gained by resolving them.

This approach enables companies to begin the journey toward data quality using targeted, incremental steps where positive ROI can be calculated. To support that effort, GS1 US is preparing a series of ROI tools to help companies calculate quantifiable ROI associated with certain attributes in order to justify a data quality program.

Purpose of this Document

This document, entitled *Warehouse Costs & Case Dimensions,* is part of that series. The ROI calculation in this document is based on warehouse savings and efficiencies that may be gained by improving the accuracy of case dimension data (specifically, case height). It provides an example that illustrates the application of that ROI model, as well as detailed steps for how to recreate that analysis using your own data.

* Note: Although this guide focuses on case height, other case dimension data can have a similar impact on warehouse costs, and you can adapt the ROI analysis provided in this document to analyze case width and depth as well.
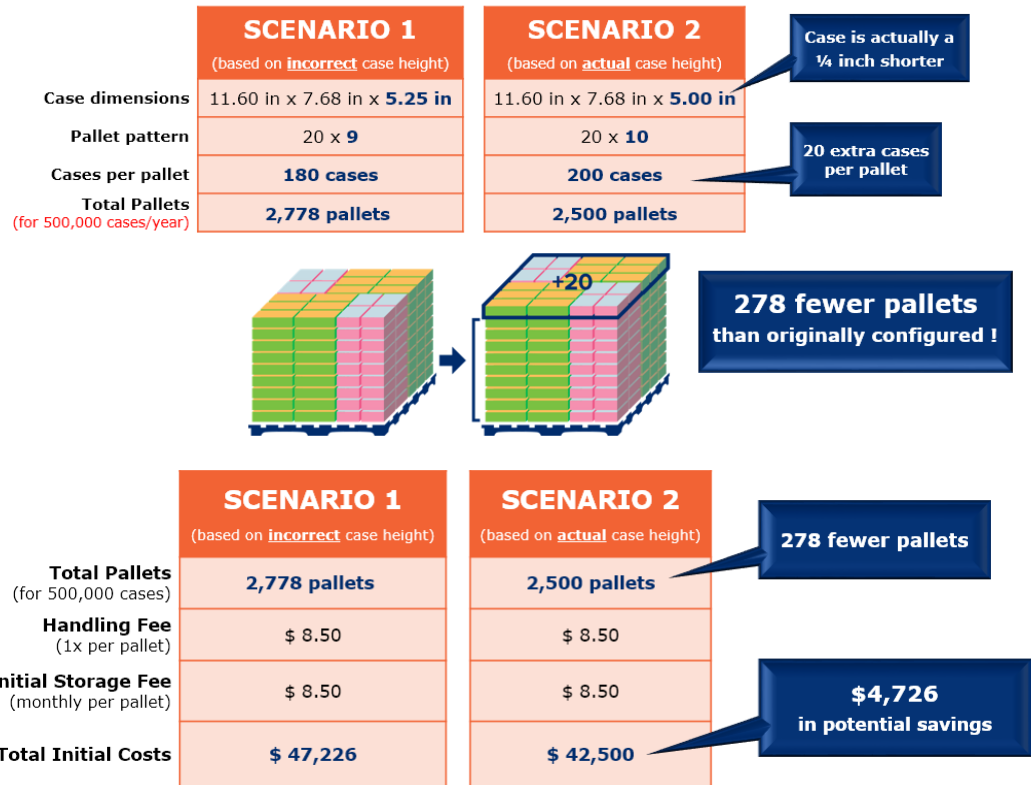
✅ **This ROI calculator is also available as an interactive spreadsheet tool. Be sure to visit** www.gs1us.org/dataquality **for more information.**

The Effect of a ¼ Inch

Errors in case dimensions can increase warehouse costs. Consider the following hypothetical situation where the height of a case is incorrectly recorded within a brand owner's data management system as ¼ inch larger than it actually is. The incorrect case height is shared with trading partners and used by systems (e.g., for pallet patterns and warehouse optimization) throughout the supply chain. This illustration demonstrates the real-world impact of that quarter inch error and the cumulative effect it has on warehouse costs. *(Assumptions: 500,000 cases sold/year; full pallets do not incur any additional charges when shipped from the warehouse because the handling fee was paid up front.)*

XYZ Widget Company – Hypothetical Widget
Assume that XYZ shipped 500,000 cases of Widgets last year…

	SCENARIO 1 (based on **incorrect** case height)	SCENARIO 2 (based on **actual** case height)	
Case dimensions	11.60 in x 7.68 in x **5.25 in**	11.60 in x 7.68 in x **5.00 in**	Case is actually a ¼ inch shorter
Pallet pattern	20 x **9**	20 x **10**	
Cases per pallet	**180 cases**	**200 cases**	20 extra cases per pallet
Total Pallets (for 500,000 cases/year)	**2,778 pallets**	**2,500 pallets**	

278 fewer pallets than originally configured !

	SCENARIO 1 (based on **incorrect** case height)	SCENARIO 2 (based on **actual** case height)	
Total Pallets (for 500,000 cases)	**2,778 pallets**	**2,500 pallets**	278 fewer pallets
Handling Fee (1x per pallet)	$ 8.50	$ 8.50	
Initial Storage Fee (monthly per pallet)	$ 8.50	$ 8.50	
Total Initial Costs	**$ 47,226**	**$ 42,500**	$4,726 in potential savings

The calculation above is for handling and initial storage fees. Let's say each pallet spends an average of three months in the warehouse, and calculate additional potential savings for recurring storage fees...

	SCENARIO 1 (based on **incorrect** case height)	SCENARIO 2 (based on **actual** case height)	
Total Pallets (for 500,000 cases)	2,778 pallets	2,500 pallets	
Avg # Months	3	3	
Recurring Storage Fee (per month per pallet)	$ 8.50	$ 8.50	$7,089 additional potential savings
Total Storage Costs	$ 70,839	$ 63,750	

That's a total potential savings of
$11,815 for this one product.

Now, let's pretend that XYZ Company has 200 SKUs, and just 3% of them have the case height overstated in a similar fashion:

That would be **$70,890** in potential savings!

Step 1: Identify a Target Set of Items to Check

Identify instances of <u>incorrect</u> case dimensions that you can use in the ROI analysis. Obviously, you cannot examine every single item your company makes/sells for this analysis. **You'll need to be strategic** -- look to operational red flags to help point you to which items might have problems:

■ Which items do your customers tell you are taller/wider/deeper than your published data?

■ Do your distribution and transportation teams routinely struggle with certain items (e.g., pulling pallets off trucks because products would not fit; pallets too tall to double stack; pallets too tall for racking; etc.)?

■ Does your customer service team routinely get complaints about certain items (e.g., order multiples, adjustments, damages, etc.)?

■ Are there certain plants/DCs where it is more challenging to build truckloads than others?

■ Do your distribution and transportation teams report problems with specific cases that have excessive or repetitive instances of damage?

■ Do you get reports of specific cases with excessive head space causing crushing?

■ Do you get reports of specific pallets with excessive overhang or underhang?

Step 2: Collect Case Dimension Data

Once you have your targeted list of items to check, collect the recorded and actual dimensions of those items:

■ Obtain the case dimension data currently recorded in your master data systems. *(Although this analysis focuses on case height, you will need the other dimensions as well to define pallet pattern.)*

■ Physically measure a sample case based on the GS1 Package Measurement Rules.

■ Compare those values for each item to identify instances of incorrect case dimensions on which you can build your ROI analysis. (If multiple instances are discovered, consider using the items with the biggest issues for the ROI analysis in order to strengthen the message to your executives.)

Step 3: Gather Warehouse Metrics to Support the Analysis

Gather the following metrics about your own warehouse costs:

■ Warehouse Handling Fees

■ Warehouse Storage Fee (per month per pallet)

■ Number of Cases Sold Annually (per item)

■ Average Months in Warehouse (per item)

■ Number of SKUs sold by your company

Step 4: Calculate the Impact on Warehouse Costs

- Using the **case dimension data** recorded in your systems for the sample item:
  - o Define the **pallet pattern** based on the **case dimensions**.
  - o Calculate the **cases per pallet** based on that pallet pattern.
  - o Divide the number of **cases sold annually** by the number of **cases per pallet** to calculate the **number of pallets** needed annually.
  - o Add the **warehouse handling fee** plus the **warehouse initial storage fee** to calculate the **initial costs per pallet**.
  - o Multiply the **initial costs per pallet** by the **number of pallets** to calculate the **total initial costs** based on the recorded data.
  - o Multiply the **average number of months in storage** times the **warehouse recurring storage fee** (per pallet per month) to calculate the **storage costs per pallet**.
  - o Multiply **storage costs per pallet** by the **number of pallets** to calculate **total storage costs** based on the recorded data.
  - o Add **total initial costs** plus **total storage costs** to calculate **total warehouse costs.**
- Repeat the sub-bullets in the previous step using the **case dimension data** based on your measurements.
- Subtract the **total warehouse costs** based on the recorded data from the **total warehouse costs** based on your measurements to calculate the **extra warehouse costs incurred annually** for this item.
- Multiply the **total number of SKUs** sold by your company by **.03** (3%) to calculate an **estimated number of items having similar issues** with case height data.
- Multiply the **estimated number of items having similar issues** by the **extra warehouse costs incurred annually** for the sample item to calculate **potential annual savings** for your company.

Note: The other case dimensions can have a similar impact on warehouse costs. You can adapt this ROI analysis for width and depth in order to analyze their impact on warehouse costs as well.

✅   **This ROI calculator is also available as an interactive spreadsheet tool. Be sure to visit** www.gs1us.org/dataquality **for more information.**

Worksheet

GTIN	
Item Description	

SCENARIO 1: Using the dimension data *recorded in your systems* for the sample item:		
case dimensions		*L x W x H obtained from your systems*
pallet pattern		*based on case dimensions*
cases per pallet		*based on pallet pattern*
cases sold annually		*metric*
number of pallets		*cases sold annually ÷ cases per pallet*
warehouse handling fee		*metric (per pallet)*
warehouse initial storage fee		*metric (per pallet per month)*
initial costs per pallet		*warehouse handling fee + warehouse initial storage fee*
total initial costs		*initial costs per pallet x number of pallets*
average number of months in storage		*metric*
recurring storage costs per pallet		*average number of months in storage x recurring storage fee*
total storage costs		*recurring storage costs per pallet x number of pallets*
total warehouse costs		*total initial costs + total storage costs*
SCENARIO 2: Repeat that analysis using the *dimension data from your measurements:*		
case dimensions		*L x W x H obtained from your measurements*
pallet pattern		*based on case dimensions*
cases per pallet		*based on pallet pattern*
cases sold annually		*metric*
number of pallets		*cases sold annually ÷ cases per pallet*
warehouse handling fee		*metric (per pallet)*
warehouse initial storage fee		*metric (per pallet per month)*
initial costs per pallet		*warehouse handling fee + warehouse initial storage fee*
total initial costs		*initial costs per pallet x number of pallets*
average number of months in storage		*metric*
recurring storage costs per pallet		*average number of months in storage x recurring storage fee*
total storage costs		*recurring storage costs per pallet x number of pallets*
total warehouse costs		*total initial costs + total storage costs*
COMPARISON		
extra warehouse costs per year		*total warehouse costs Scenario 2 - total warehouse costs Scenario 1*
total # of SKUs		*metric*
estimated # of items with issues		*total number of SKUs x .03*
potential annual savings		*estimated # of items with issues x extra warehouse costs per year*

Additional Resources

Get started with the GS1 US National Data Quality Program:

- GS1 US National Data Quality Program Framework
- GS1 US Data Quality Assessment Guide (for benchmarking where your organization stands in terms of data quality processes and to identify areas of opportunity)
- GS1 US National Data Quality Program – Data Governance Best Practice Guidance
- GS1 US National Data Quality Program Certification Quick Start Guide
- Data Quality ROI Calculators for Brand Owners:
  - Transportation Costs & Case Weight
  - Transportation Costs & Case Dimensions
  - Warehouse Costs & Case Dimensions

Advance your data quality program:

- Attend a GS1 US Data Quality Workshop.

Need in-depth guidance for your data quality program?

- Contact GS1 US Advisory Services for customized training and implementation support to address company-specific data quality challenges.

All of the above resources are accessible at www.gs1us.org/dataquality.

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